



Oil & Gas Industry Day

February 27, 2018

Utah State Tax Commission



Oil and Gas Production/Water Disposal

Discount Rate

Cap Rate Variables

- Comparable Companies
- Capital Structure
- Debt Rate
- Equity Rate

Comparable Companies

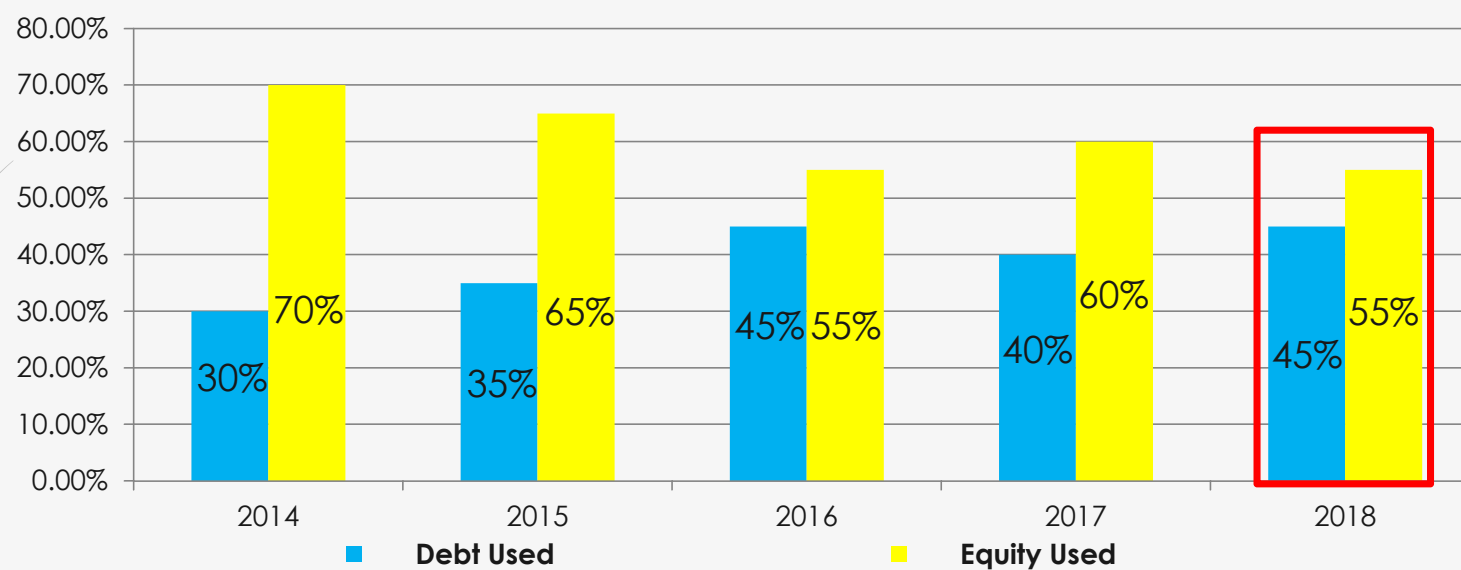
2017

- Abraxas Petrol
- Bill Barrett
- Bonanza Creek Energy
- Continental Resources
- Earthstone Energy
- Encana Corporation
- Legacy Reserves
- Matador Resources
- Newfield Exploration
- Pioneer Natural Resources
- QEP Resources
- Resolute Energy Corporation
- SM Energy CO
- Southwestern Energy
- Whiting Petroleum
- WPX Energy, Inc.

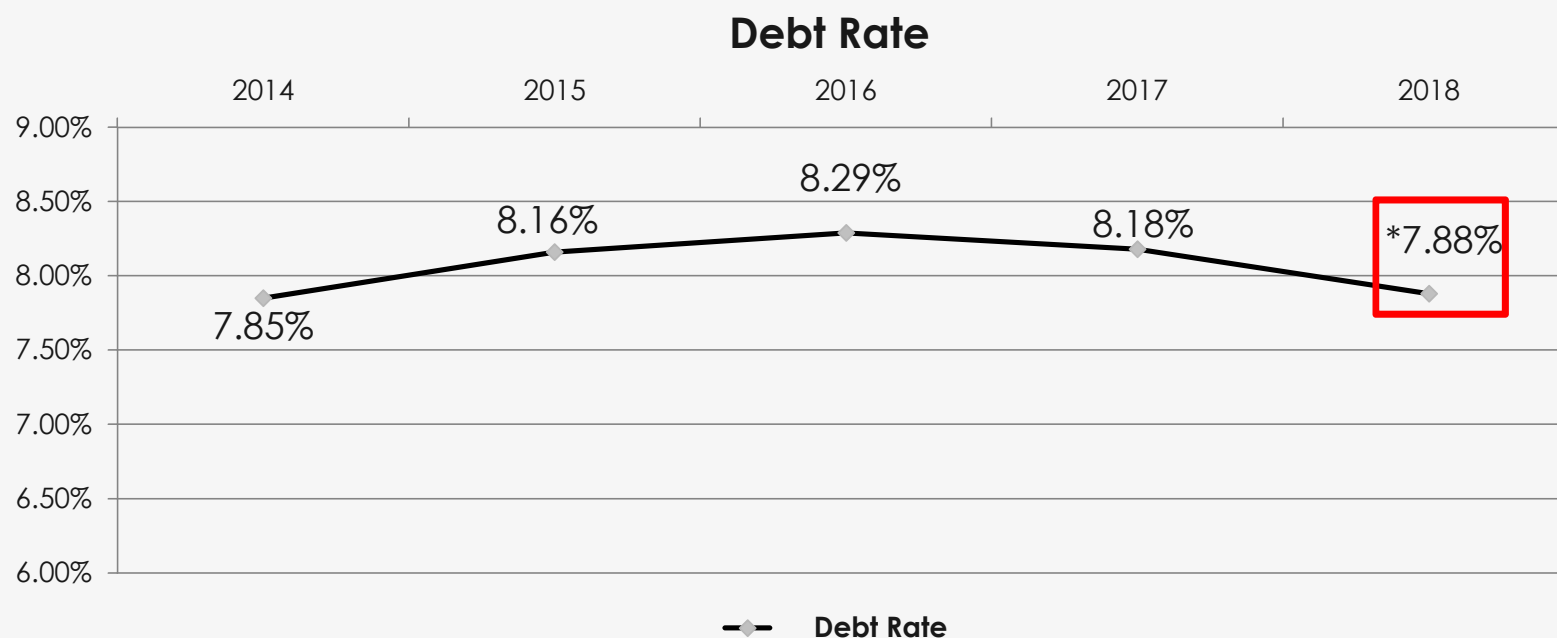
2018

- Abraxas Petrol
- Bill Barrett
- Black Stone Minerals
- Carrizo Oil & Gas
- Continental Resources
- Denbury Resources
- Encana Corporation
- Legacy Reserves
- Newfield Exploration
- Pioneer Natural Resources
- QEP Resources
- Resolution Energy Corporation
- SM Energy CO
- Southwestern Energy
- Whiting Petroleum
- WPX Energy

5 Year Capital Structure History

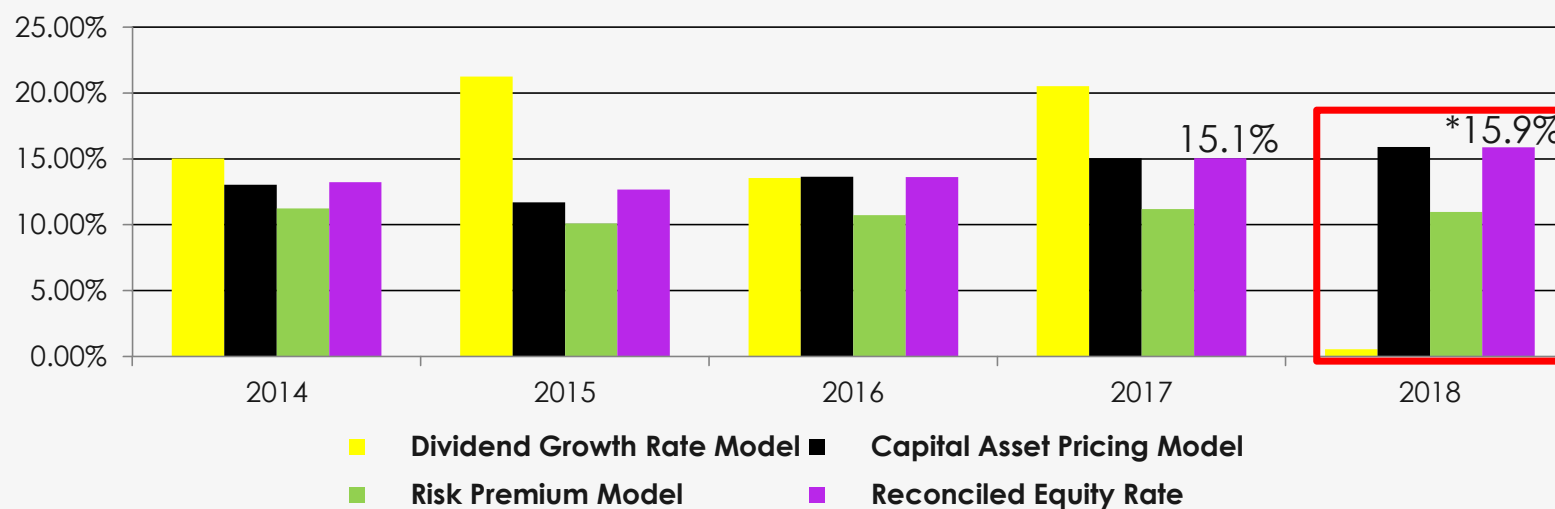


5 Year Debt Rate History



*Average of comparable company debt ratings

5 Year Equity Rate History



*Reconciled equity rate weighted for calculation method

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$

Production/WD Discount Rate

Weighted Average Cost of Capital Discount Rate Calculation			
	Rate	Capital Structure	Weighted Rate
Debt	7.88% (B1)	45%	3.55%
Equity	16.15%	55%	8.88%
Before Taxes WACC			12.43%
Tax Adjusted WACC			15.39%

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$



Oil and Gas Gathering

Discount Rate

Comparable Companies

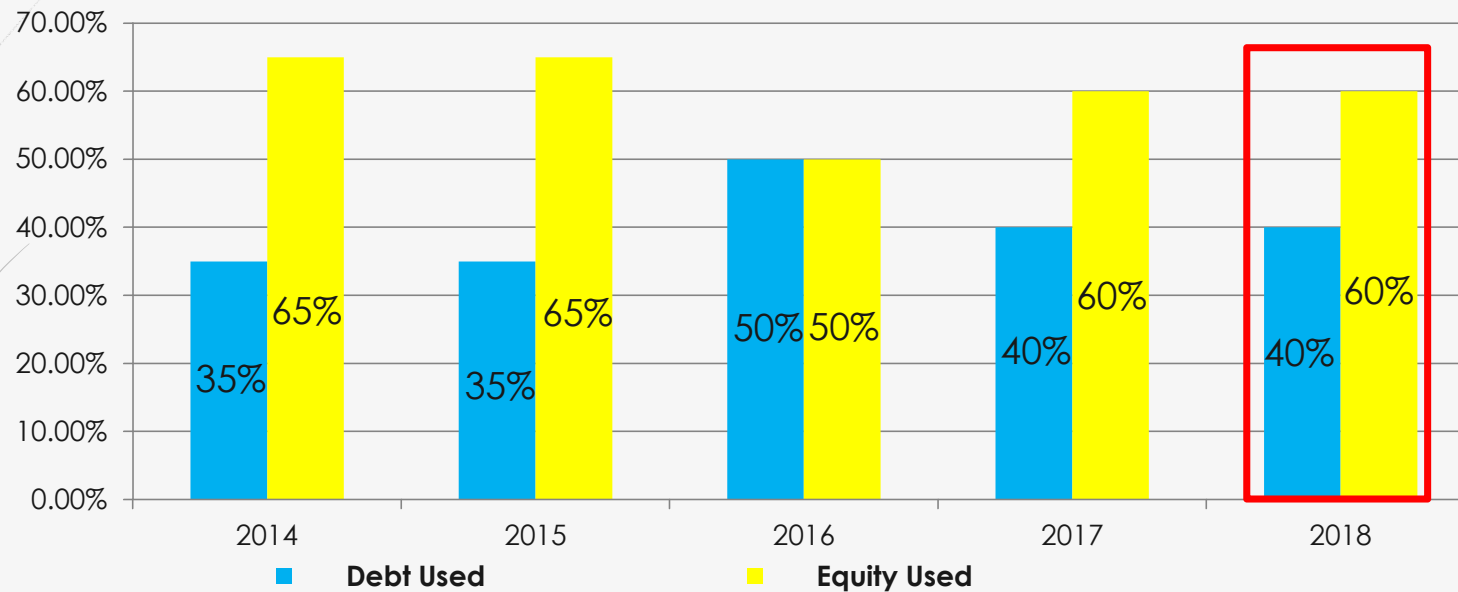
2017

- Crestwood Equity Partners
- Energy Transfer Partners
- Oneok Inc
- Plains All American Pipeline
- Summit Midstream Partners
- Tallgrass Energy Partners
- Western Gas Partners
- Williams Cos

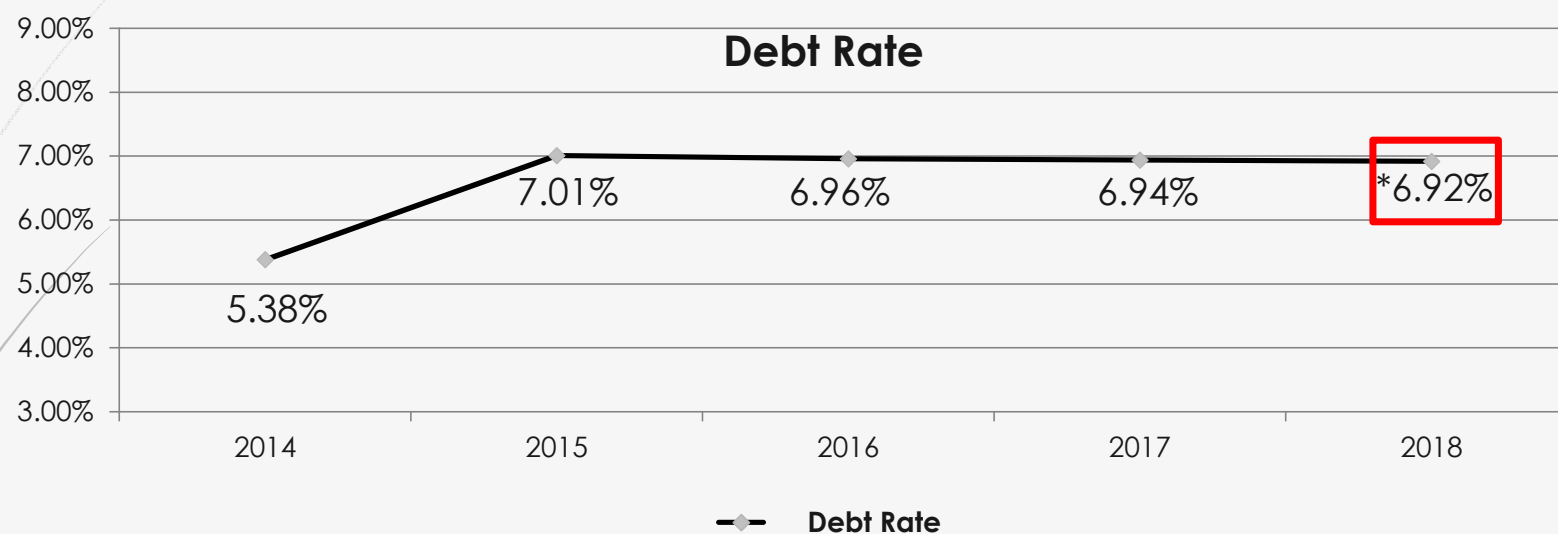
2018

- Crestwood Equity Partners
- Dominion Energy
- Energy Transfer Partners
- Plains All American Pipeline
- Summit Midstream Partners
- Tallgrass Energy Partners
- Western Gas Partners
- Williams Cos

5 Year Capital Structure History

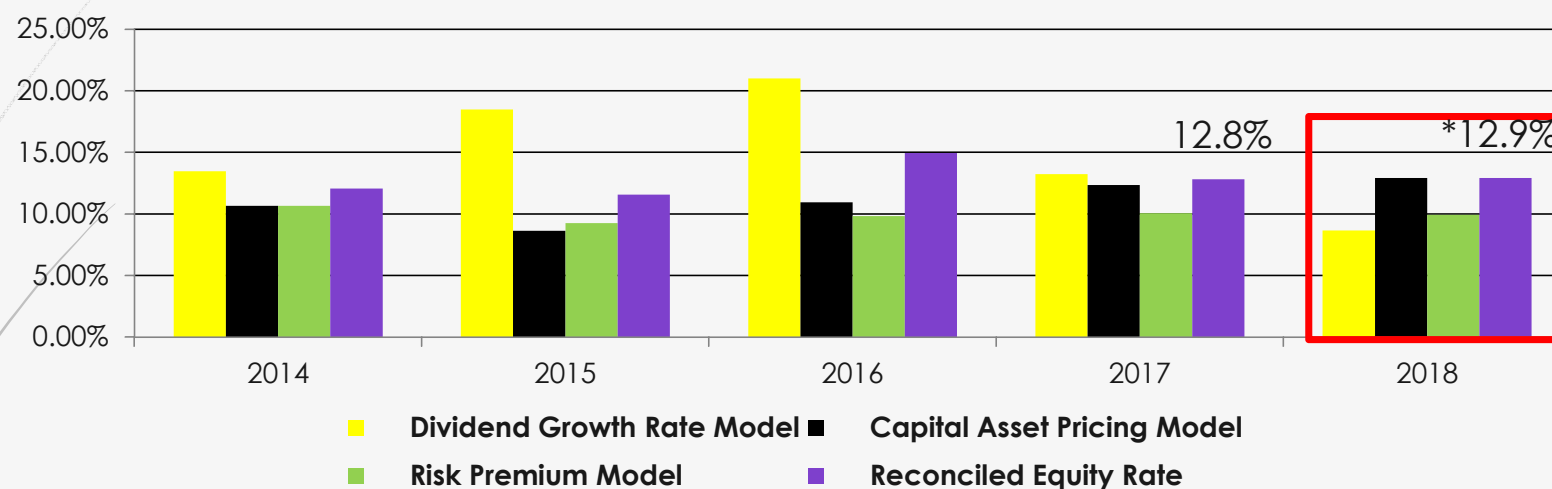


5 Year Debt Rate History



*Average of comparable company debt ratings

5 Year Equity Rate History



*Reconciled equity rate weighted for calculation method

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$

Oil and Gas Gathering Discount Rate

Weighted Average Cost of Capital Discount Rate Calculation			
	Rate	Capital Structure	Weighted Rate
Debt	6.92% (Ba3)	40%	2.77%
Equity	13.11%	60%	7.87%
Before Taxes WACC			10.63%
Tax Adjusted WACC			13.26%

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$



Oil Price Forecast 2018

Disclaimer

- Forecasted numbers are opinions of value and are subject to significant economic factors unknown or not reported as of January 1, 2018

NOT THERE YET

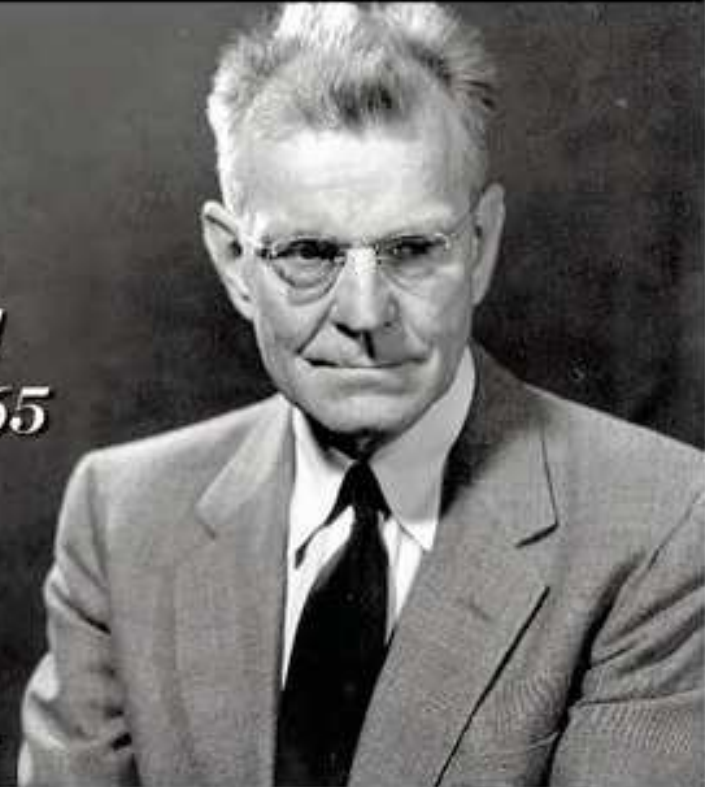
Notable past predictions of peak oil that didn't turn out

1956

M. King Hubbert,
a geologist for Shell Oil, says that

*U.S. oil production will
likely peak between 1965
and 1970 and decline
steadily thereafter.*

› Output will indeed peak in 1970 and
then trend downward—but it will jump
by two-thirds from 2009 to mid-2014.



Source: "The Quest" by Daniel Yergin, 2011

Photo: University of Wyoming/American Heritage Center

“A century ago, petroleum – what we call oil – was just an obscure commodity; today it is almost as vital to human existence as water.”

James Buchan

2017 Highlights

Global supply

- OPEC production avg 32.5 million b/d in 2017, a decrease of 0.2 million b/d from 2016
- OPEC ext. production cuts through 2018

WTI-Brent

- Brent crude oil spot price averaged \$54/bbl
- WTI nearly averaged \$47/bbl
- WTI-Brent differential averaged \$7.48/bbl

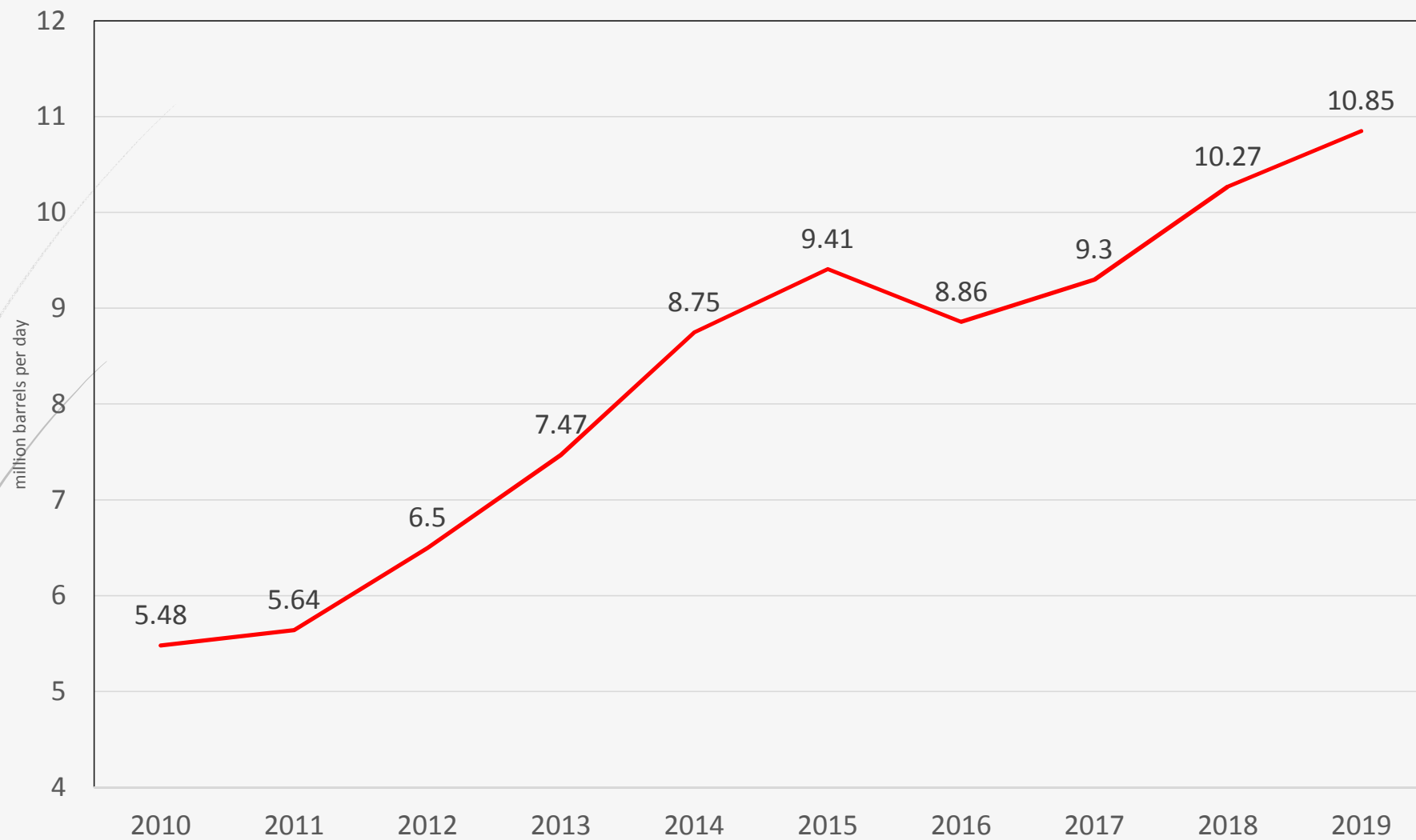
US oil production

- Increased production, reduced cost
- Hurricane Harvey (stopped production)

Global Petroleum and Other Liquids

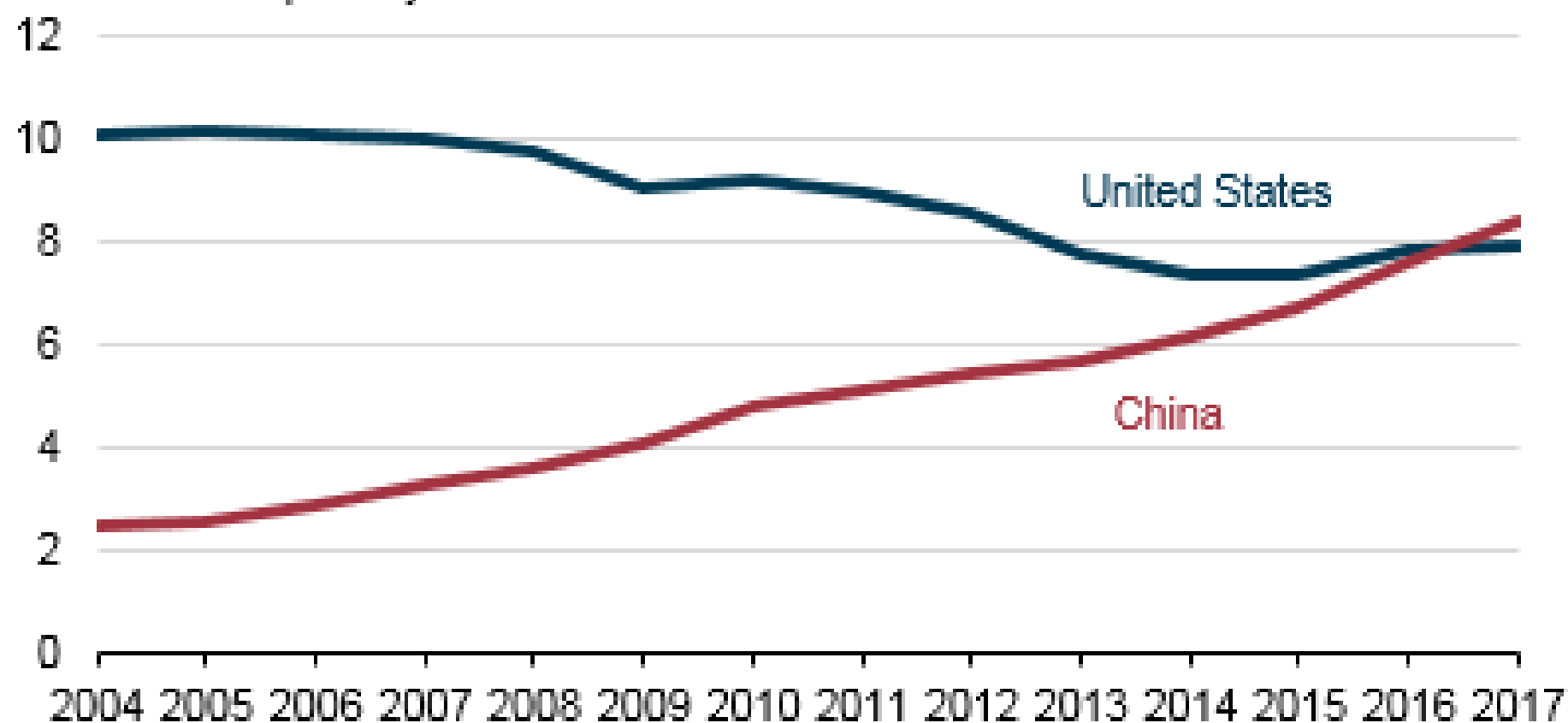
	2016	2017	2018	2019
Supply & Consumption	(million barrels per day)			
Non-OPEC Production	57.98	58.66	60.69	61.98
OPEC Production	39.23	39.31	39.64	40.12
OPEC Crude Oil Portion	32.68	32.47	32.68	32.95
Total World Production	97.21	97.97	100.34	102.11
OECD Commercial Inventory (end-of-year)	2,968	2,908	2,964	3,049
Total OPEC surplus crude oil production capacity	1.15	2.09	1.82	1.34
OECD Consumption	46.74	47.11	47.61	47.95
Non-OECD Consumption	50.20	51.28	52.50	53.81
Total World Consumption	96.95	98.39	100.11	101.76

U.S. Crude Oil Production



Annual U.S. and China gross crude oil imports (2004-2017)

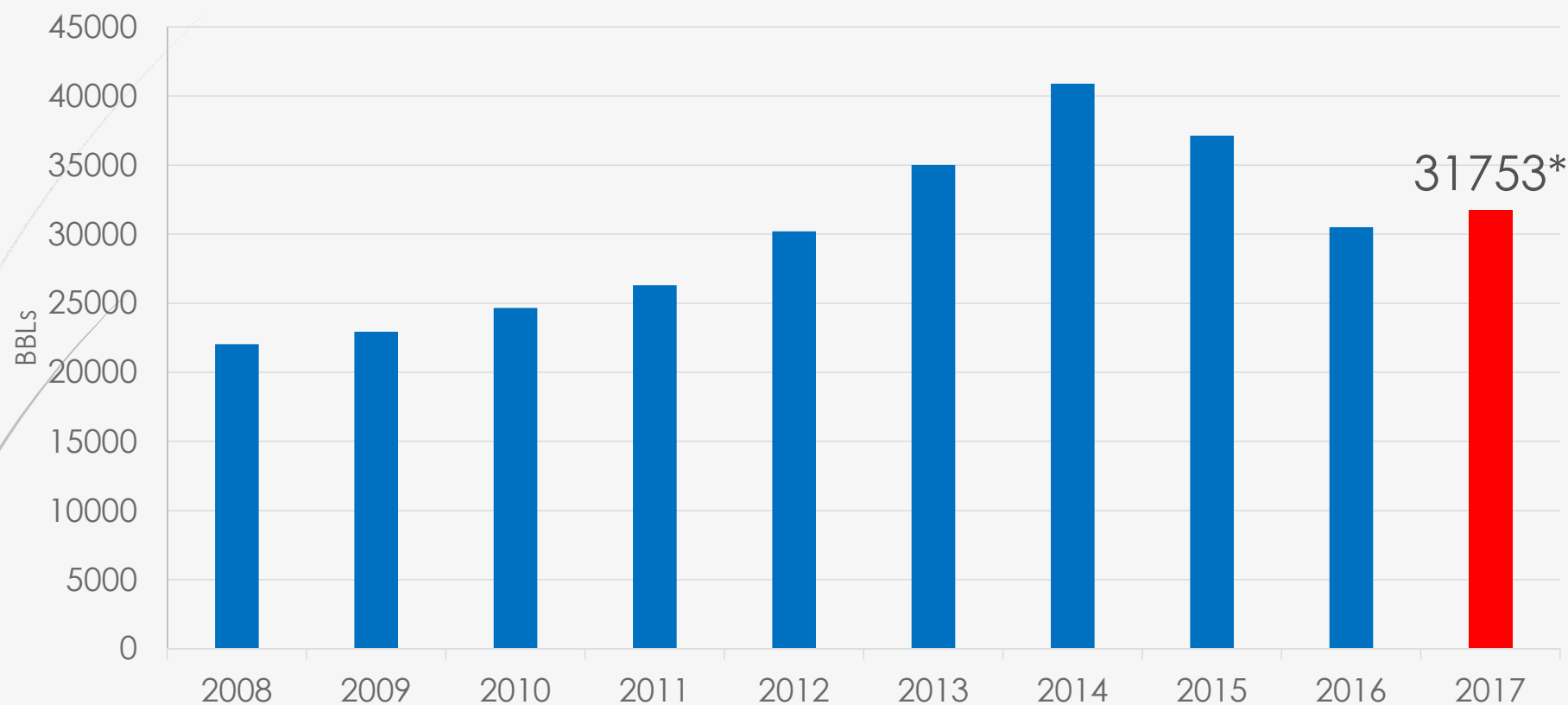
million barrels per day



Source: EIA, *Petroleum Supply Monthly* and *Weekly Petroleum Status Report*, China General Administration of Customs, based on Bloomberg, L.P.

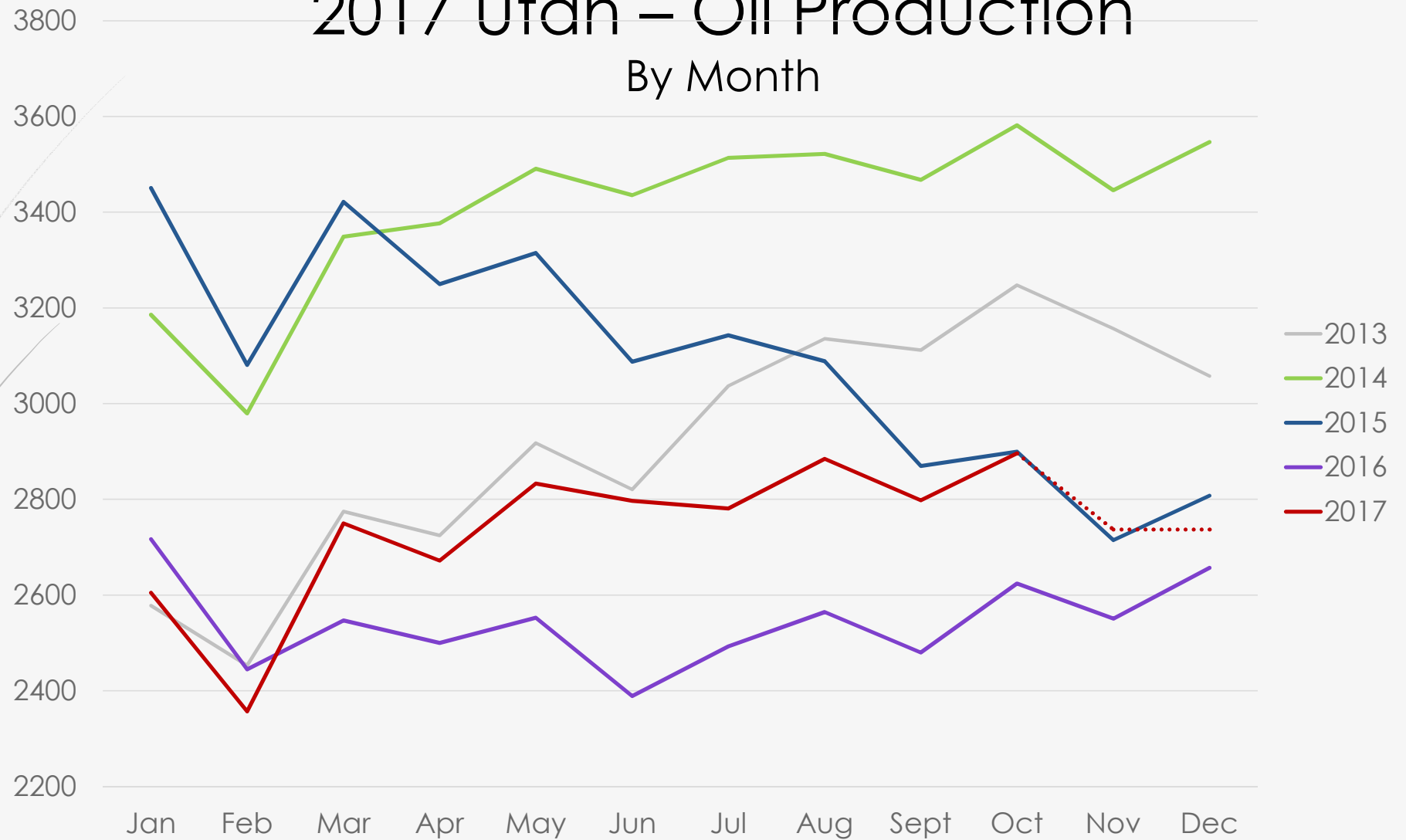
2017 Utah – Oil Production

By Year (thousands)



*** 2017 production total was annualized after November.**

2017 Utah – Oil Production By Month



2018 Expectations

Supply

- Global Decrease due to OPEC agreement
- Increased U.S. supply

Demand

- Increased globally
- Level out in U.S.

U. S. Production

- U.S. to break the all-time production record (1970)



R884-24P-10

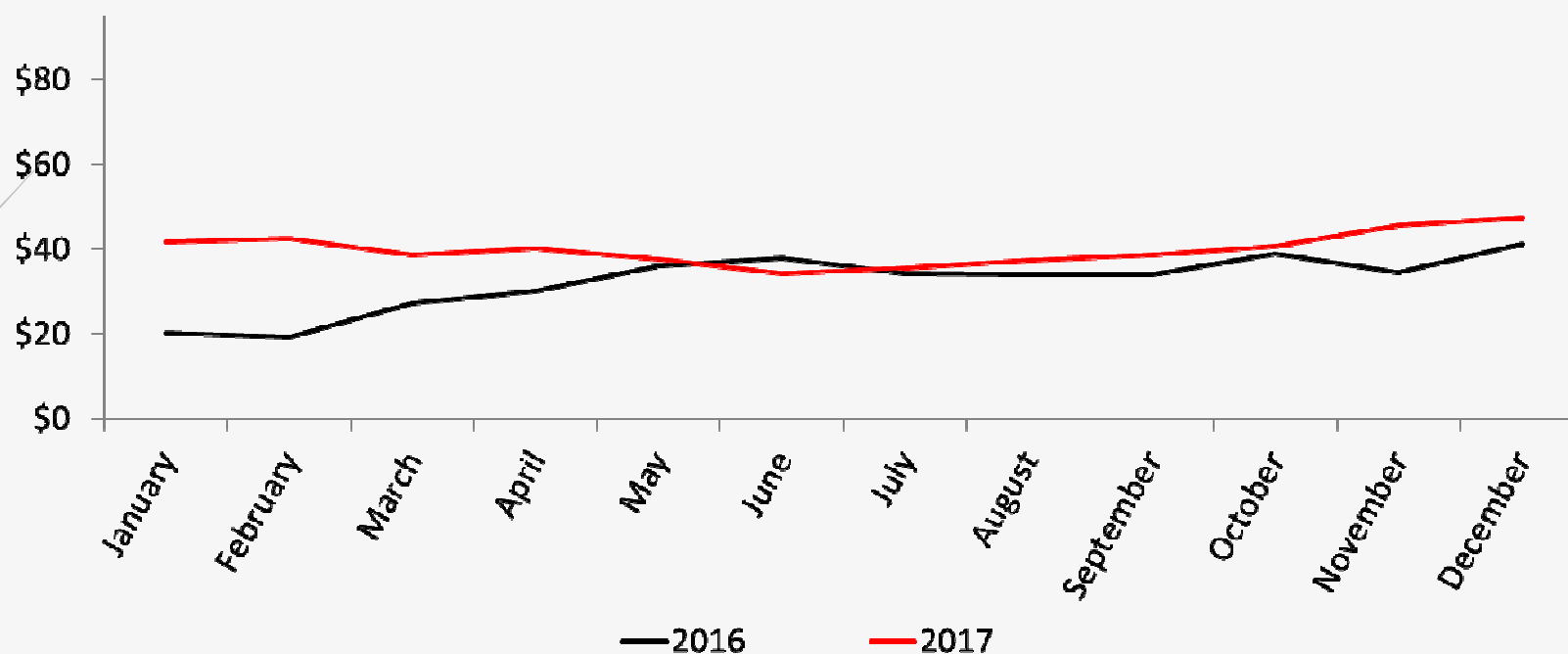
“Product Price”

- Starting price is the weighted average posted price of the previous year

Paradox Basin/Sweet – “Giant”

	Posting	2017	2016	%
Month	Days	Price	Price	Change
January	31	\$41.77	\$20.29	106%
February	28	\$42.54	\$19.22	121%
March	31	\$38.67	\$27.10	43%
April	30	\$40.15	\$30.02	34%
May	31	\$37.59	\$35.90	5%
June	30	\$34.23	\$37.71	-9%
July	31	\$35.62	\$34.07	5%
August	31	\$37.22	\$34.01	9%
September	30	\$38.57	\$33.99	13%
October	31	\$40.58	\$38.83	5%
November	30	\$45.60	\$34.56	32%
December	31	\$47.45	\$41.18	15%
Year End Weighted Average Price \$/BBL		\$40.00	\$32.24	24%

Weighted Crude Oil Posted Prices Paradox Basin/Sweet – “Giant”

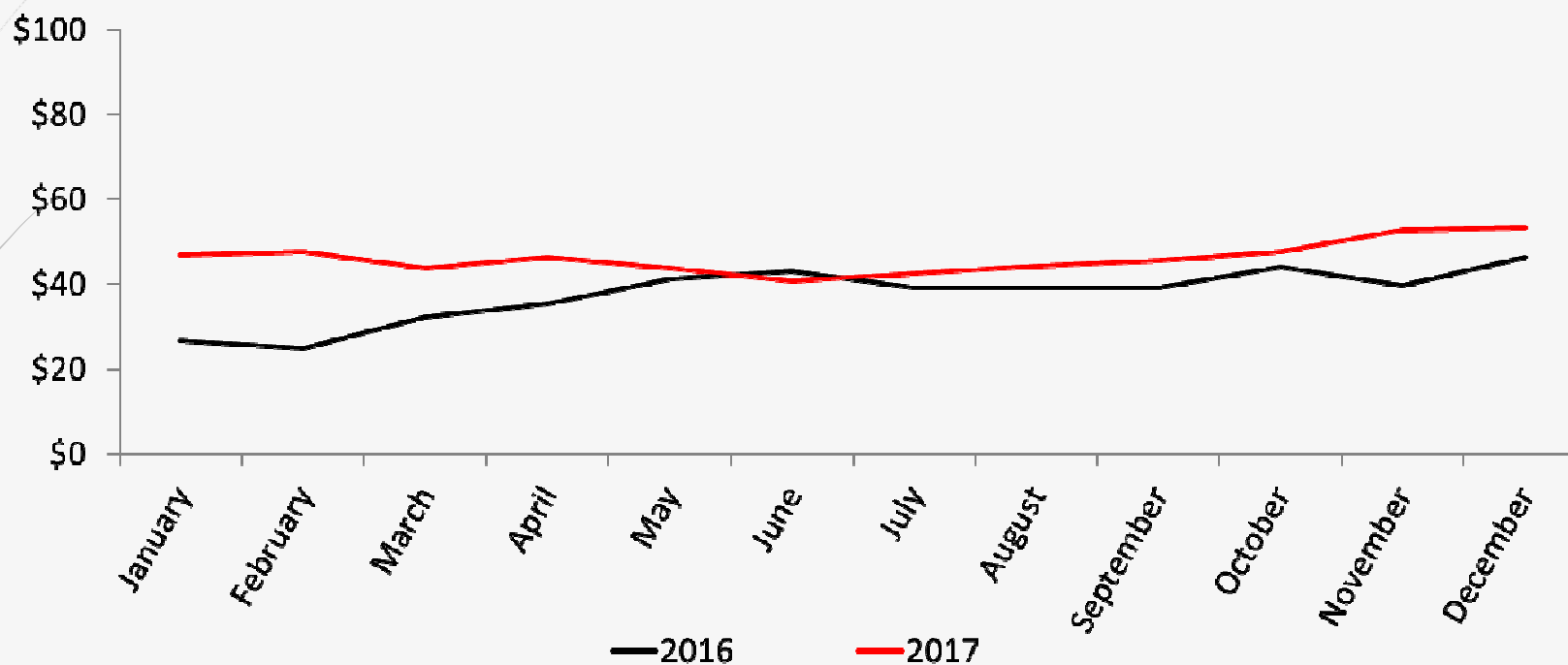


Uinta Basin Black Wax – “Chevron”

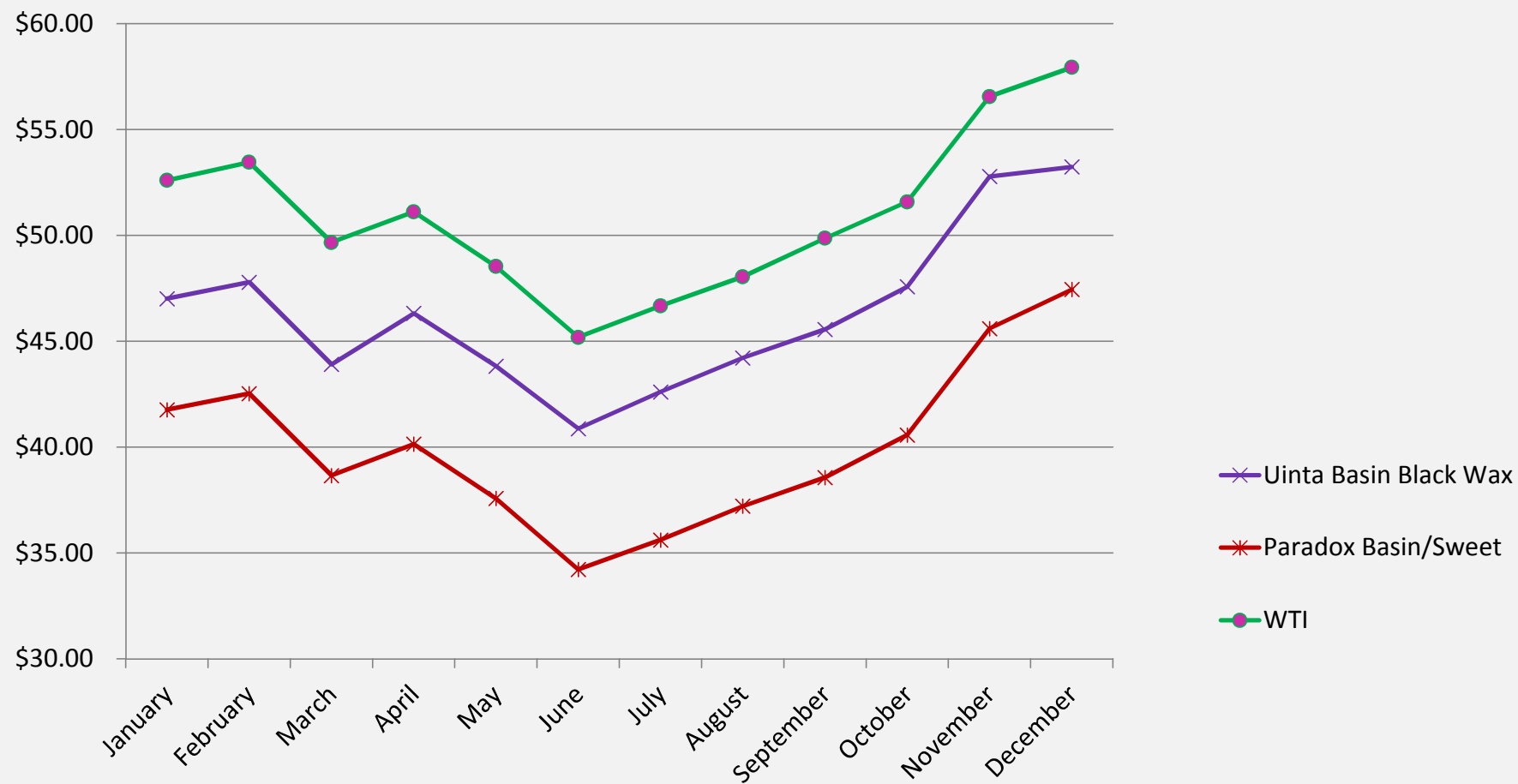
	Posting	2017	2016	%
Month	Days	Price	Price	Change
January	31	\$47.02	\$26.54	77%
February	28	\$47.80	\$24.85	92%
March	31	\$43.92	\$32.35	36%
April	30	\$46.33	\$35.27	31%
May	31	\$43.83	\$41.15	7%
June	30	\$40.88	\$42.96	-5%
July	31	\$42.62	\$39.32	8%
August	31	\$44.22	\$39.26	13%
September	30	\$45.57	\$39.24	16%
October	31	\$47.58	\$44.08	8%
November	30	\$52.79	\$39.83	33%
December	31	\$53.25	\$46.46	15%
Year End Weighted Average Price \$/BBL		\$46.32	\$37.61	23%

Weighted Crude Oil Posted Prices Uinta Basin Black Wax

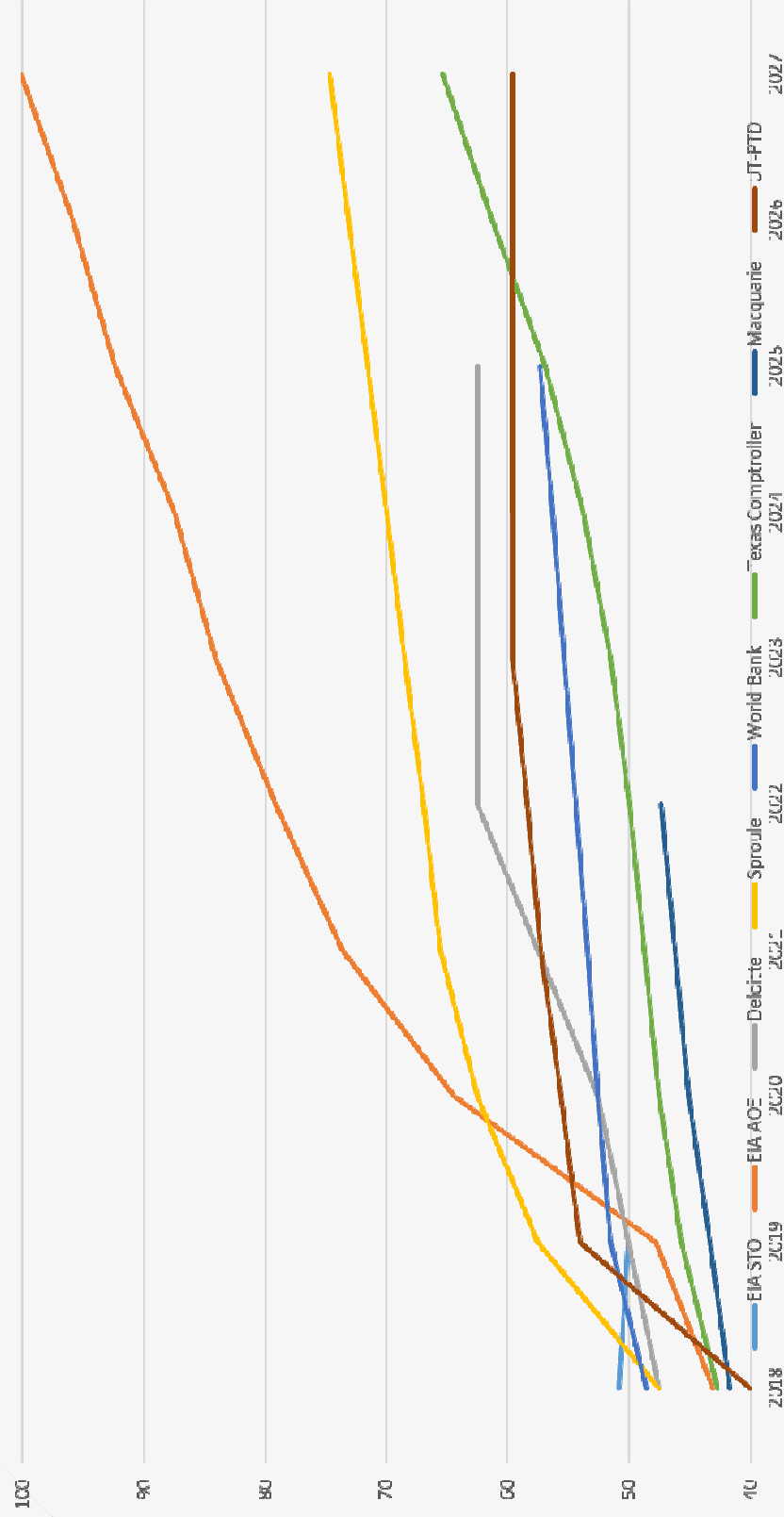
30



WTI Differentials Monthly 2017



Oil Forecast 2018



2018 Oil Price Forecast

Paradox Basin

Forecast of **10 Year's** Prices

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average of 2017 Monthly Prices	40.00										
Forecast with High & Low to 2 std dev		52.00	53.04	54.10	54.64	55.18	55.18	55.18	55.18	55.18	55.18
% Increase / Decrease			2.0%	2.0%	1.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Sources for Oil Price Forecasting

U.S. EIA – United States Energy Information Administration

- Short Term Outlook (STO)
- Annual Energy Outlook (AEO)

EIU – Economist Intelligence Unit

- Economic and Commodity Prices Forecast

NYMEX (CME Group) – New York Mercantile Exchange for futures prices

Sproule Associates – Petroleum consultants annual forecast

AJM Deloitte – Petroleum consultant company annual forecast

Texas Comptroller –Pritchard & Abbott, Inc. Method

- Price Adjustment Factor(PAF) & Producer Price Index(PPI)

Macquarie Tristone – Energy lenders' price forecast survey

Moody's –Investor service forecast



Natural Gas Price Forecast 2018

Utah 2017- Overview

- National statistics
- Utah gas well statistics
- Utah State Tax Commission gas price forecast

Natural Gas Price Forecast

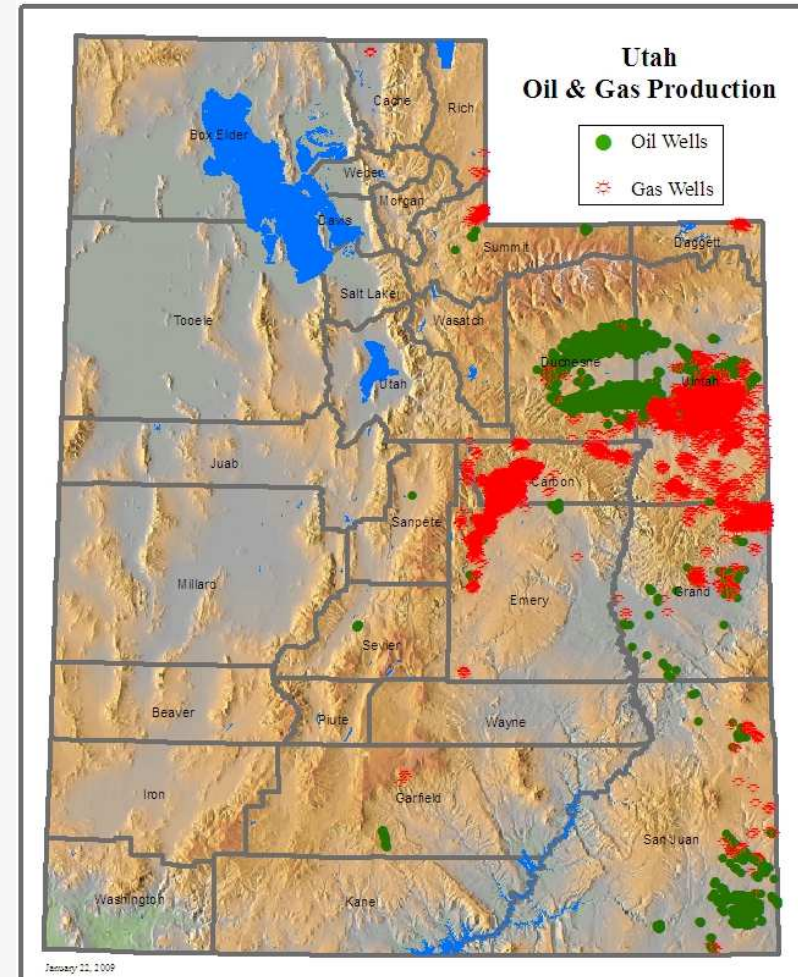
■ Gas Product Price

- If sold under contract, the price shall be the stated price as of January 1, adjusted for escalation and de-escalation
- If sold on the spot price market or to a direct end-user, the price shall be the average price received for the 12-month period immediately preceding January 1, adjusted for escalation and de-escalation

Utah Tax Code R884-24P-14 (1)

Natural Gas Pricing Factors

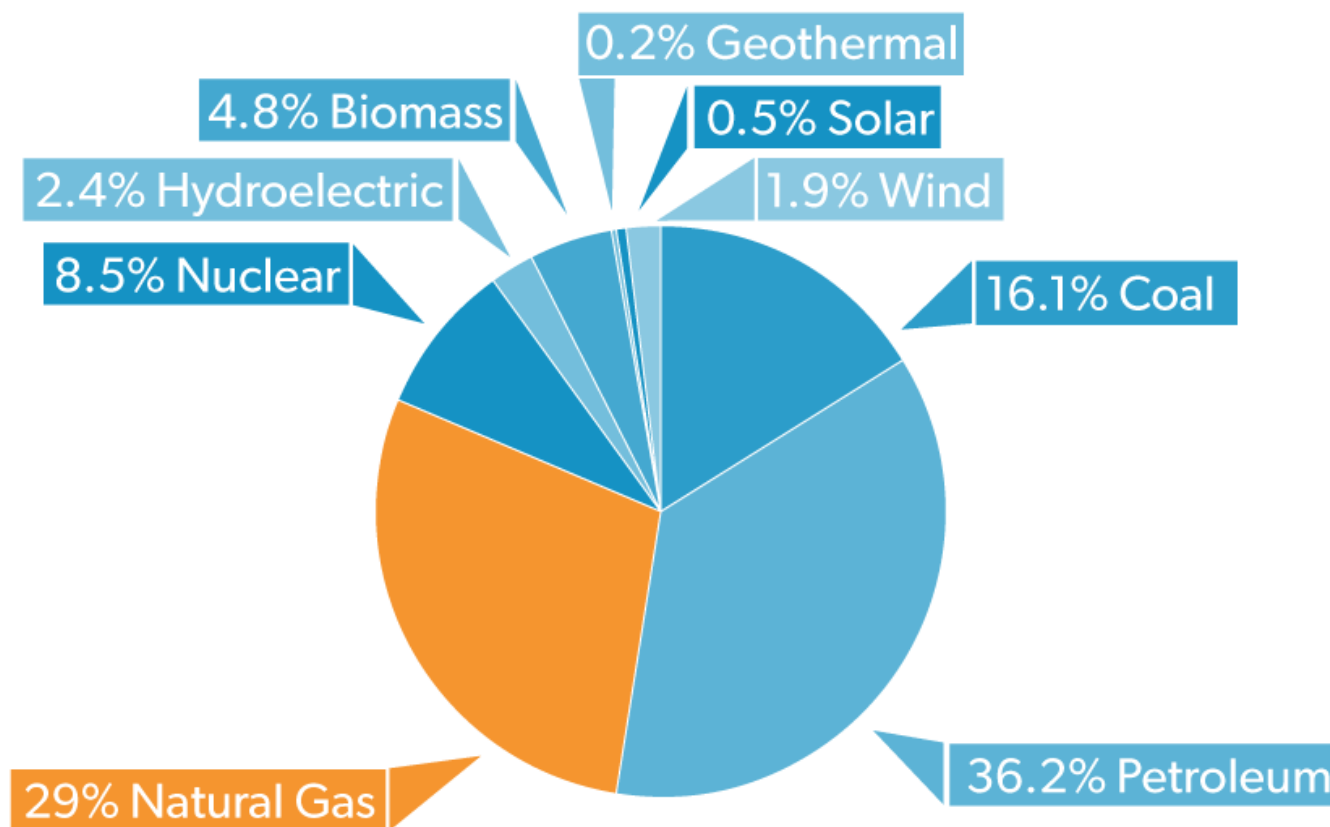
- Data Analysis:
 - Supply
 - Demand
 - Drilling
 - Production
- Other Variables
 - Weather
 - Economy



Source- DOGM

Natural Gas

Percent of Total U.S. Energy Consumption



1% increase compared to previous year

Source: EIA, MER, March 2016

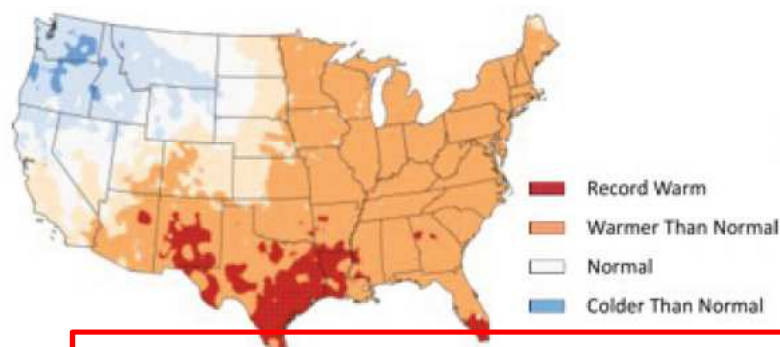
Demand: Winter Weather

Last Winter: Nov. – March

2016-2017 ACTUAL

Actual winter heating season:

1% colder than previous winter but
13% warmer than 30-year average



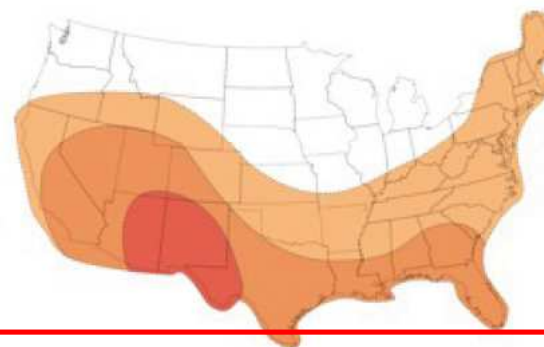
3,074 Heating degree days (NOAA)

This Winter

2017-2018 FORECAST

Forecast:

13% *colder* than last year, but still
1% warmer than 30-year average



3,468 Heating degree days

Winter-to-winter pressure
on natural gas prices



Pressure Points on Gas Prices

- **Weather**- Forecasted to be colder than last year ↑
- **Economy**- Similar GDP growth from previous year =
- **Demand**- Projected increases in residential, commercial, exports, and industrial ↑
- **Storage**- Forecasted to place neutral pressure on prices =
- **Supply**- Projected increase in production ↓

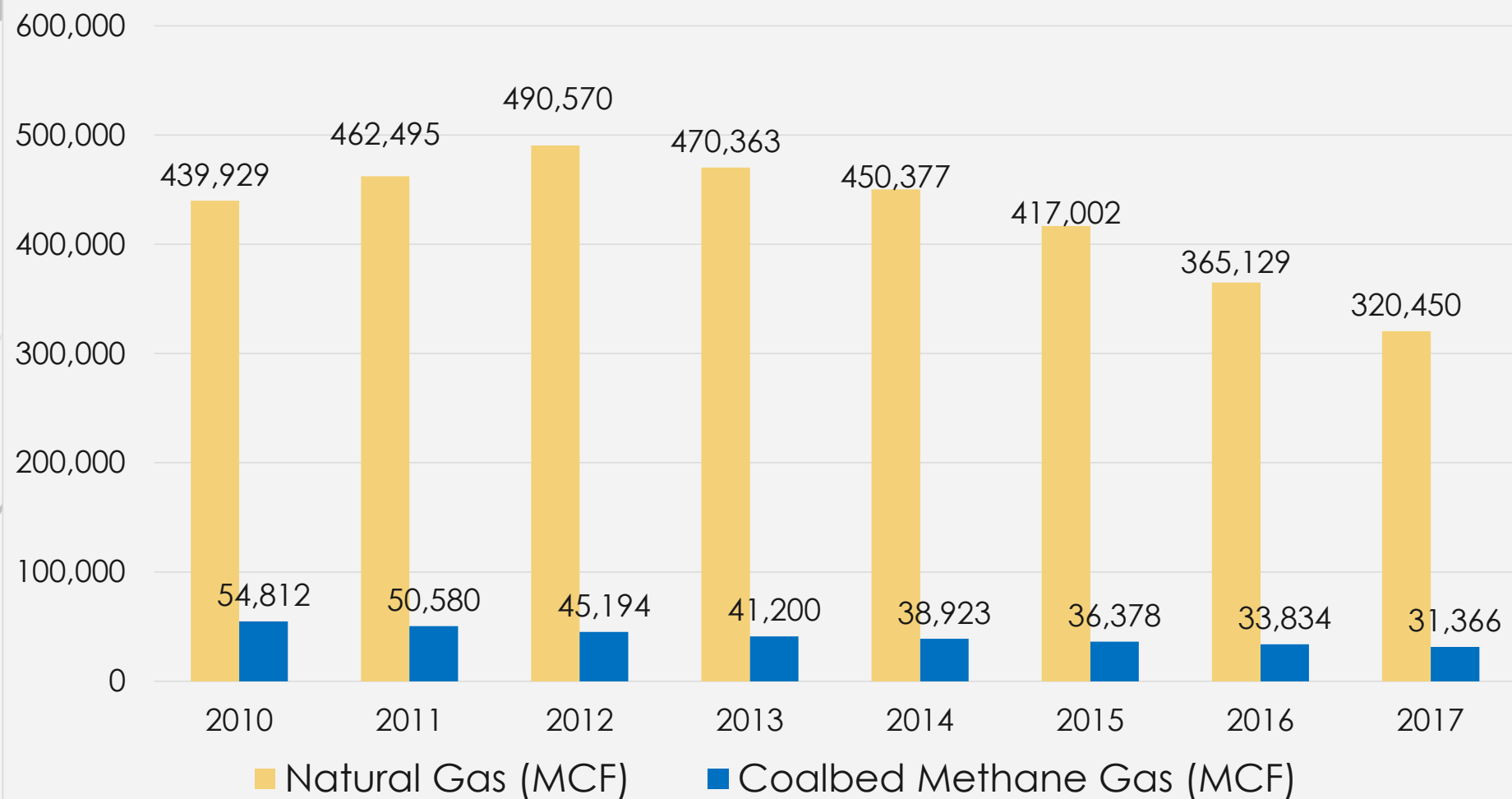
Current Gas Well Count in Utah

Utah Gas Wells Plugged by Year			
<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
68	76	164	56

Current Utah Gas Well Count	
Producing Gas Wells	7,265
Shut-in Gas Wells	1,110
Total	8,375

Source- DOGM (Feb 2018)

Utah Gas Production by Year



Source- DOGM (In thousands, *2017 is annualized)

2017 Henry Hub / Opal Differential

MONTH	HENRY HUB GAS PRICES	OPAL GAS PRICES	DIFFERENTIAL
January	3.94	3.73	0.21
February	3.39	3.11	0.28
March	2.62	2.29	0.33
April	3.18	2.64	0.54
May	3.14	2.62	0.52
June	3.24	2.79	0.45
July	3.06	2.63	0.43
August	2.97	2.59	0.38
September	2.95	2.59	0.36
October	2.97	2.48	0.49
November	2.74	2.63	0.11
December	3.08	2.73	0.35
Average	3.11	2.74	0.37

NORTHWEST PIPELINE OPAL, WYOMING

MONTH	PREVIOUS YEAR 2016	WEIGHTED PRICE 2017	% CHANGE
January	\$2.28	\$3.73	64%
February	\$2.02	\$3.11	54%
March	\$1.51	\$2.29	52%
April	\$1.51	\$2.64	75%
May	\$1.77	\$2.62	48%
June	\$1.78	\$2.79	57%
July	\$2.52	\$2.63	4%
August	\$2.51	\$2.59	3%
September	\$2.62	\$2.59	-1%
October	\$2.70	\$2.48	-8%
November	\$2.62	\$2.63	0%
December	\$2.99	\$2.73	-9%
Year End Average Price	\$2.24	\$2.74	22%

Opal Northwest Pipeline

